WHAT IS CLAIMED IS:

1. A method for treating a disease or illness in a mammal, said method comprising administering to said mammal a composition comprising a compound in an amount effective to elicit a chemopreventative effect or a therapeutic effect or a prophylactic effect or a chemoprotective effect, said compound having the formula:

$$A - CH(D) - CO_2H$$

wherein the stereochemical configuration of the alpha carbon is predominantly R-stereoisomer or is R-stereoisomer substantially free from the S-stereoisomer and wherein A is an aliphatic moiety that is alkyl of 3 to about 30 carbon atoms, substituted alkyl of 3 to about 30 carbon atoms, alkene of 3 to about 30 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkene having from 3 to about 30 carbon atoms and having from 1 to about 10 unsaturations, alkyne of 3 to about 30 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkyne having from 3 to about 30 carbon atoms and having from 1 to about 10 unsaturations, and wherein D is alkyl of 1 to about 10 carbon atoms, or a physiologically acceptable ester or salt thereof or a metabolic precursor thereof.

2. A method according to Claim 1 wherein said disease or illness is diabetes, obesity, inflammation, cystic fibrosis, dementia, or neoplastic disease.

3. A method according to Claim 1 wherein said mammal is a human.

4. A method according to Claim 1 wherein said composition is administered orally, transdermally, intravenously or by suppository.

5. A method according to Claim 1 wherein said composition is administered in an amount of from about 1.0 mg to about 10,000 mg per day in one or more doses.

6. A method according to Claim 1 wherein said composition is administered in an amount of from about 10 mg to about 2000 mg once or twice a day.

7. A method according to Claim 1 wherein said composition comprises a pharmaceutically acceptable carrier.

8. A method according to Claim 1 wherein A is selected from the group consisting of C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3}, and C_nH_{2n-5} wherein n is 3 to about 20 and wherein 1 to about 5 carbon atoms are optionally substituted with alkyl, branched alkyl, alkenyl, or alkynyl groups.

9. A method according to Claim 1 wherein A comprises a moiety of the formula:

$$E\text{-}(CH_2(CH_2)_aCH(Y)(CH_2(CH_2)_bCH(Y))_m(CH_2(CH_2)_c\text{-}$$

wherein m is 0 to 3 and wherein Y are independently alkyl having from 1 to about 10 carbon atoms and wherein the carbon atoms comprising the Y groups are independently R-enantiomer substantially free from S-enantiomer, S-enantiomer substantially free from R-enantiomer, or one or more of the carbon atoms comprising the Y groups may be a combination of S-enantiomers and R-enantiomers and a, b and c are independently an integer of 1 to 5 and wherein the carbon atoms not comprising the Y groups may be substituted with one or more substituents and

wherein E is an aliphatic moiety that is alkyl of 1 to about 20 carbon atoms, substituted alkyl of 1 to about 20 carbon atoms, alkene of 2 to about 20 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkene having from 2 to about 20 carbon atoms and having from 1 to about 10 unsaturations, alkyne of 2 to about 20 carbon atoms and having from 1 to about 10 unsaturations,

or substituted alkyne having from 2 to about 20 carbon atoms and having from 1 to about 10 unsaturations.

10. A method according to Claim 10 wherein A comprises a moiety of the formula:

$$E\text{-}CH_2CH_2CH(Y)(CH_2CH_2CH(Y))_mCH_2CH_2CH_2\text{-}.$$

11. A method according to Claim 10 wherein A comprises a moiety of the formula:

$$E\text{-}CH_2CH_2CH(Y)(CH_2CH_2CH_2CH_2CH(Y))_mCH_2CH_2CH_2\text{-}.$$

12. A method according to Claim 1 wherein said compound is R,R,R-phytanic acid or R,R,R-pristanic acid or a physiologically acceptable salt thereof or R,R,R-phytol as a metabolic precursor to R,R,R-phytanic acid and R,R,R-pristanic acid.

13. A method for treating a disease or illness in a mammal, said method comprising administering to said mammal a composition comprising a compound in an amount effective to elicit a chemopreventative effect or a therapeutic effect or a prophylactic effect or a chemoprotective effect, said compound having the formula:

$$A' - CH(D') - CO_2H$$

wherein the stereochemical configuration of the alpha carbon is predominantly R configuration or is R substantially free from the S configuration and wherein A' is an aliphatic moiety that is alkyl of 5 to about 20 carbon atoms, substituted alkyl of 5 to about 20 carbon atoms, alkene of 5 to about 20 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkene having from 5 to about 20 carbon atoms and having from 1 to about 5 unsaturations, alkyne of 5 to about 20 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkyne having from 5 to about 20 carbon atoms and having from 1 to about 5 unsaturations, and wherein D' is alkyl of 1 to about 5 carbon atoms,

or a physiologically acceptable ester or salt thereof or a metabolic precursor thereof.

14. A method according to Claim 13 wherein said disease or illness is a metabolic disorder, inflammation, cystic fibrosis, dementia, or neoplastic disease.

15. A method according to Claim 13 wherein said mammal is a human.

16. A method according to Claim 13 wherein said composition is administered orally, transdermally, intravenously or by suppository.

17. A method according to Claim 13 wherein said composition is administered in an amount of from about 1.0 mg to about 10,000 mg per day in one or more doses.

18. A method according to Claim 13 wherein said composition is administered in an amount of from about 10 mg to about 2000 mg once or twice a day.

19. A method according to Claim 13 wherein said composition comprises a pharmaceutically acceptable carrier.

20. A method according to Claim 13 wherein A' is selected from the group consisting of C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3}, and C_nH_{2n-5} wherein n is 5 to about 20 and wherein 1 to about 5 carbon atoms are optionally substituted with alkyl, branched alkyl, alkenyl, or alkynyl groups.

21. A method according to Claim 13 wherein A' comprises a moiety of the formula:

$$E'\text{-}\ (CH_2(CH_2)_aCH(Y)(CH_2(CH_2)_bCH(Y))_m(CH_2(CH_2)_c\ \text{-}$$

wherein m is 0 to 3 and wherein Y is independently alkyl having from 1 to about 5 carbon atoms and wherein the carbon atoms comprising the Y groups are independently R-enantiomer substantially free from S-enantiomer, S-enantiomer substantially free from R-enantiomer, or one or more of the carbon atoms comprising the Y groups may be a combination of S-enantiomers and R-enantiomers and a, b and c are independently an integer of 1 to 5 and wherein the carbon atoms not comprising the Y groups may be substituted with one or more substituents and

wherein E' is an aliphatic moiety that is alkyl of 1 to about 12 carbon atoms, substituted alkyl of 1 to about 12 carbon atoms, alkene of 2 to about 12 carbon atoms and having from 1 to about 5 unsaturations, or substituted alkene having from 2 to about 12 carbon atoms and having from 1 to about 5 unsaturations, alkyne of 2 to about 12 carbon atoms and having from 1 to about 5 unsaturations, or substituted alkyne having from 2 to about 12 carbon atoms and having from 1 to about 5 unsaturations.

22. A method according to Claim 21 wherein A' comprises a moiety of the formula:

$$E'\text{-}CH_2CH_2CH(Y)(CH_2CH_2CH(Y))_mCH_2CH_2CH_2\text{-}.$$

23. A method according to Claim 21 wherein A' comprises a moiety of the formula:

$$E'\text{-}CH_2CH_2CH(Y)(CH_2CH_2CH_2CH_2CH(Y))_mCH_2CH_2CH_2\text{-}.$$

24. A method according to Claim 21 wherein

25. A method according to Claim 21 wherein E' is selected from the group consisting of C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3}, and C_nH_{2n-5} wherein n is 1 to about 10 and wherein 1 to about 5 carbon atoms are optionally substituted with alkyl, branched alkyl, alkenyl, or alkynyl groups.

26. A method according to Claim 22 wherein E' is selected from the group consisting of C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3}, and C_nH_{2n-5} wherein n is 1 to about 10 and wherein 1 to about 5 carbon atoms are optionally substituted with alkyl, branched alkyl, alkenyl, or alkynyl groups and the like.

27. A method according to Claim 21 wherein A' comprises a moiety of the formula:

$$E'\text{-}CH_2CH_2CH(Y)(CH_2(CH_2)_zCH(Y))_mCH_2CH_2CH_2 -$$

wherein m is 0 to 3 and z is 1, 3, 5, or 7 and wherein Y is independently alkyl having from 1 to about 5 carbon atoms and wherein the carbon atoms not comprising the Y groups are optionally substituted with one or more substituents.

28. A method according to Claim 13 wherein the compound has the formula:

$$Z\text{–}CH(CH_3)\text{–}CO_2H$$

wherein the alpha carbon is predominantly R-enantiomer or is R-enantiomer substantially free from S-enantiomer and Z is an aliphatic carbon chain that is alkyl of 3 to about 10 carbon atoms, substituted alkyl of 3 to about 10 carbon atoms, alkene of 3 to about 10 carbon atoms having 1 to 2 unsaturations, or substituted alkene having from 3 to about 10 carbon atoms having 1 to 2 unsaturations, alkyne of 3 to about 10 carbon atoms having 1 to 2 unsaturations, or substituted alkyne having from 3 to about 10 carbon atoms having 1 to 2 unsaturations.

29. A method according to Claim 13 wherein the compound has the formula:

$$Q\text{—}CH_2CH_2CH(CH_3)CH_2CH_2CH(CH_3)CH_2CH_2CH_2CH(CH_3)\text{–}CO_2H$$

wherein the carbon atom alpha to the carboxyl group is predominantly R-enantiomer or is R-enantiomer substantially free of S-enantiomer and the other carbon atoms comprising the methyl groups are independently R-enantiomers

substantially free from S-enantiomers, S-enantiomers substantially free from R-enantiomers or mixtures thereof, and wherein Q is selected from the group consisting of alkyl of 1 to about 10 carbon atoms, substituted alkyl of 1 to about 10 carbon atoms, alkene of 2 to about 10 carbon atoms and having from 1 to about 3 unsaturations, or substituted alkene having from 2 to about 10 carbon atoms and having from 1 to about 3 unsaturations, alkyne of 2 to about 10 carbon atoms and having from 1 to about 3 unsaturations, or substituted alkyne having from 2 to about 10 carbon atoms and having from 1 to about 3 unsaturations.

30. A method according to Claim 29 wherein the compound has the formula:

$Q'–CH_2CH_2CH_2CH_2CH(CH_3)CH_2CH_2CH_2CH_2CH(CH_3)CH_2CH_2CH_2CH(CH_3)–CO_2H$

wherein the carbon atom alpha to the carboxyl group is predominantly R-enantiomer or is R-enantiomer substantially free of S-enantiomer and the other carbon atoms comprising the methyl groups are independently R-enantiomers substantially free from S-enantiomers, S-enantiomers substantially free from R-enantiomers or mixtures thereof, and wherein Q' is selected from the group consisting of alkyl of 1 to about 6 carbon atoms, substituted alkyl of 1 to about 6 carbon atoms, alkene of 2 to about 6 carbon atoms and having from 1 to 2 unsaturations, or substituted alkene having from 2 to about 6 carbon atoms and having from 1 to 2 unsaturations, alkyne of 2 to about 6 carbon atoms and having from 1 to 2 unsaturations, or substituted alkyne having from 2 to about 6 carbon atoms and having from 1 to 2 unsaturations.

31. A method for treating a disease or illness in a mammal, said method comprising administering to said mammal a composition comprising an enantiomerically stable form of a compound in an amount effective to elicit a chemopreventative effect or a therapeutic effect or a prophylactic effect or a chemoprotective effect, said compound having the formula:

W-C(X)(D)-COOH

wherein X is alkyl of 1 to about 10 carbon atoms and D is alkyl of 1 to about 10 carbon atoms and wherein W is hydrogen or alkyl of 1 to about 30 carbon atoms, substituted alkyl of 1 to about 30 carbon atoms, alkene of 2 to about 30 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkene having from 2 to about 30 carbon atoms and having from 1 to about 10 unsaturations, alkyne of 2 to about 30 carbon atoms and having from 1 to about 10 unsaturations, or substituted alkyne having from 2 to about 30 carbon atoms and having from 1 to about 10 unsaturations or the pharmaceutically acceptable esters thereof or a metabolic precursor thereof.

32. A method according to Claim 31 wherein X is methyl, D is methyl and W is hydrogen or alkyl of 1 to about 20 carbon atoms, substituted alkyl of 1 to about 20 carbon atoms, alkene of 2 to about 20 carbon atoms and having from 1 to 2 unsaturations, or substituted alkene having from 2 to about 20 carbon atoms and having 1 to 2 unsaturations, alkyne of 2 to about 20 carbon atoms and having 1 to 2 unsaturations, or substituted alkyne having from 2 to about 20 carbon atoms and having 1 to 2 unsaturations, or a physiologically acceptable ester thereof.

33. A method according to Claim 32 wherein W is hydrogen.